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PEST BIRD CONTROL WITH THE AVICIDE BCF 7000-SUN OIL REFINERY PROJECT, TULSA, OKLAHOMA

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ABSTRACT: The Sun Refinery at Tulsa presented a new and special type of problem that I had never faced before. The refinery is just across the Arkansas River from downtown Tulsa. Many species of protected birds roost and nest within the confines of the refinery proper and in the surrounding river bank areas to the north, urban and manufacturing area to the east and southeast, rail yards to the south, and hills to the south and southwest. According to Sidney Cabbiness, Environmental Egineer for Sun, the following birds and other animals are known to make this area their home or feeding sites at least some time during the year: meadowlarks, scissortails, mallards, yellowthroat, killdeer, red-tailed hawks, sparrow hawks, red-winged blackbirds, mourning doves, mockingbirds, robins, grackles, magpies, crows, squirrels, red foxes, rabbits, raccoons, bobwhites, great blue herons, domestic cats, bald eagles, golden eagles, great white egrets, kingfishers, Canadian geese, blue geese, roadrunners, skunks, horses just outside the south fence, dairy cattle just to the west, and, of course, our pigeons, starlings and house sparrows.

Hawks are prevalent year-round, and the eagles primarily winter at Keystone Lake, just west of Tulsa, and are known to feed up and down the river as well as occasionally on the tank farm. The problem species is starlings, more than 750,000, by my best estimate, along with about 3,000 to 4,000 pigeons. A few sparrows roost around the Club Room and on a loading dock, but they aren't the real problem. Regularly available registered products and techniques would have been either ineffective in solving the existing problem or too dangerous to use in such an environmentally sensitive area. Damage to the units from the droppings was extensive, but the potential health and safety hazards that the birds and their droppings presented to the employees were the primary factors in prompting Sun to seek outside professional help.

The development of the avicide BCF 7000 and its use at this Tulsa site has provided a safe and effective solution for the problem. Starling reinfestation the following season (1985-86 winter) has been ZERO. No adverse comments or reactions were received by this office, or by anyone to my knowledge. Much work is still needed to acquire a federal registration, but we are well on our way to providing the pest control community with another much needed tool.

INTRODUCTION

During September 1983 while I was attending the First Eastern Wildlife Damage Control Conference at Cornell University, I received a call from the Sun Oil Company about a severe starling problem that they had been experiencing *every* winter for the last several years at their Tulsa refinery. Upon surveying the situation, I realized that this was an extremely sensitive environment to conduct a bird control project. Bald eagles winter within a few miles and have been known to feed frequently up and down the Arkansas River adjacent to the facility as well as in the tank farm area. Both red-tailed hawks and sparrow hawks also frequent the area, and some even nest within the perimeter fence. Many other species of nontarget birds also live within or frequent the facility and its unit areas.

My many previous contact with Mr. Edward W. Schafer, Jr., Group Leader, Chemical Development Group, Bird Damage Section, U.S. Fish and Wildlife Service, Denver Wildlife Research Center, had made me aware of DRC-1347, a material which is the free base of DRC-1339, the active ingredient in Starlicide®, a Ralston Purina product, which is a somewhat selective starling toxicant for use around feedlots. Upon contacting the Denver Center and acquiring their existing data about DRC-1347, we embarked upon a program to develop a formulation that we felt would provide the best characteristics possible for a product to solve this type of problem.

We designate this a "Restricted Use" product, not because of the nature of the product, but because of the environmental sensitivity of any bird control project using toxicants. We thought that a contact toxicant which could be applied directly to the roosting, staging, and loafing areas of the target birds would be best, thus avoiding "new object repellency" that sometimes occurs with the use of Rid-A-Bird® perches. We felt we needed a product that could be applied with a hand sprayer, for many areas where bird problems exist, other methods of application using larger equipment would be difficult or impossible. The material must be thick enough to stay where applied, even on a slant, at varied temperatures, yet be able to be applied through a hand sprayer. It must not freeze at temperatures where it might normally be used (to -40) and not run to temperatures approaching 120°F. It must photodegrade when applied within a relatively short period of time (<10 days) so that it is no longer toxic to exposed birds, but it must remain active long enough (>3 days) to eliminate the desired target birds. It should be able to be washed off of an area after it has been applied with no more than moderate rainfall (allowing an area just serviced to be washed down just after treatment if emergency maintenance is needed). It should dry leaving no sticky residue if it is not washed off. Its flashpoint must be high enough so that no special warnings, packaging, or handling are necessary. The formulation should be such that the signal word on the label is "CAUTION".

A crash research and development program of several months' duration produced our new avicide product, "BCF-7000" (manufactured by Bird Management Research, Inc.). We were able to produce a product that had virtually all of these desired qualities, and we applied to the Oklahoma Department of Agriculture for a 24C Special Local Need state label. The state, after much review of the data presented, approved the label (EPA SLN # 0K840007) and sent it on to EPA in Washington for review. Initial indications from Washington were that they were going to disallow the label, but the subsequent publication of its approval in the December 19, 1984 Federal Register gave us the notice we needed to proceed with the project.

The day before actual application began, we held a meeting with refinery personnel, USFWS personnel, and Oklahoma State and Federal Department of Agriculture personnel to discuss the project. Health Department personnel had been informed of the project and the meeting, but were not in attendance. We reviewed survey results, product assessment and safety guidelines, and the history of the development of BCF-7OOO. We discussed projections of estimated results, and reviewed potentially sensitive and/or problem areas that we thought might potentially occur, even though the probability was very small. We set up a 24-hour "Dirty Bird Hotline" telephone line to receive any reports of problems or complaints.

METHODS

Application was made by a team of four men using two 1-gallon B&G stainless steel sprayers and two specially modified 2-1/2-gallon B&G stainless steel sprayers. One of the sprayers was modified only to the extent of putting a pressure gauge into a tee at the base of the discharge hose to monitor pressure at that point. The other sprayer had the piston pump removed, the hole in the center of the brass cap that the pump rod had gone through was threaded, and a male hydraulic quick coupling was attached. A SCUBA tank (3000 psi) was fitted with an adjustable primary regulator which reduced the line pressure to 165 psi on the tank end, a 3-foot long high-pressure hose, and a 0-165 psi secondary regulator with a female hydraulic quick coupling, a line pressure gauge, and a tank pressure gauge on the delivery end. With this arrangement the sprayer tank could be pressurized to the desired pressure and kept at that pressure without having to pump the sprayer. In cases where the applicator is unable to carry both the pressure tank and the sprayer tank with them, the pressure tank can be disconnected without loss of pressure on the sprayer tank, and the applicator can use the spray tank in this manner until the pressure drops due to product use to the point that the spray tank must be repressurized.

Application was begun in the Crude Unit, the area of the plant with the largest number and heaviest concentrations of birds. The pressurized tank was used at full (165 psi) pressure, but especially when the temperature was below 50°F., that was insufficient to apply the material at an acceptable speed. The hand pump sprayers were also used, but since no one could pump over 130 psi by hand, that was also exceedingly slow. After 3 days of work, we decided to formulate a new batch with just a little less thickening agent, and that batch, along with a new secondary regulator that could go to 185 psi, made a considerable improvement in speed and ease of application.

Application was begun in the units most affected, and in the areas of those units where most of the birds that roosted overnight in those units would contact the applied material (i.e., handrails and top framework of the various structures and towers of the unit). The next day application would be made in other units or in other areas previously untreated to allow the material time to work. After 2 to 4 days, evening observations could tell us any areas needing retreating or additional areas previously untreated that needed service. Giving the material time to work and closely monitoring evening influx of remaining birds are two of the vital keys to a successful program of this type. Third and even fourth applications in a unit to catch the last of the stragglers are many times necessary. There are times that it seems more difficult to get the last three or four remaining birds in a unit than it was to get the first ten thousand, but achieving total elimination is important to reduce the probability of reinfestation.

Once 75% to 80% population reduction is achieved, much more time is spent in observation of the remaining birds than is spent in actual application of avicides. It is vital, however, to realize that now, even more than before, you need all the observers you can get to pinpoint exact locations of remaining birds, and many times this is the point at which you discover that you have birds roosting in areas that you previously thought were "clean."

Precipitation also was a factor. The material is formulated so that it will be washed off even in a light-to-moderate rain shower. Several incidences of significant rainfall throughout the project gave us ample opportunity to prove that the material worked properly in this respect, and we found that it did. We had several opportunities to completely retreat unit areas that we had just serviced a day or two before because of the rain. This can be aggravating at the time, but the safety margin it gives the material is worth the inconvenience and extra work.

Prompt pickup and proper disposal of carcasses are vitally important to public relations as well as the sanitation aspect of the project. We had two radio-dispatched bird pickup crews of two men each monitoring the refinery and surrounding areas 6 days a week throughout the initial treatment phase of the project. Results of their carcass pickup are detailed in the Project Service/Bird Pickup Chart, and summarized in the Unit Bird Pickup Totals chart. A "dedicated dumpster" was provided by Sun for the storage of the plastic bags containing bird remains until the end of the initial treatment phase, at which time they were buried at the landfill. Some carcasses collected where the birds were still alive were quick-frozen and sent to the USFWS Denver Wildlife Research Center for feeding studies and residue analysis. A report on the results of these tests is available.

RESULTS/DISCUSSION

During the period February 26 through March 19, 1985, the population of roosting pigeons and starlings was reduced to zero. Only one "nontarget" bird carcass was found, that of a cowbird which had apparently been roosting with the starlings. Due to the fact that this project was started so late in the season, there is no way of knowing for sure how many of the roosting birds were actually killed and how many left due to the spring breakup of the winter roost. The only way we had of estimating this is by the reinfestation that would occur during the following year. Three followup inspections throughout 1985 showed a minor reinfestation of pigeons in a few areas, but these were quickly eliminated. Starling/Pigeon reinfestation during the 1985/86 fall/winter season was ZERO.

Domestic cats and crows, both of which are very sensitive to the toxicant used, were observed alive and well within the refinery during the project, and no mortality was reported, even though both species had relatively free access to bird carcasses each morning. Hawks were observed on two occasions feeding on pigeons, with no observed adverse results. Total numbers on nontarget birds including raptors actually increased in the refinery and surrounding area during the project.

To the best of my knowledge, the only "complaint" received by anyone was to the USFWS office by a homeowner southwest of the refinery who reported dead "black birds" in his yard. Refinery personnel who monitored their home neighborhoods reported seeing an "occasional dead starling" for as far as 40 miles out to the south and west. I received no reports of groups of carcasses outside the area monitored by the pickup crew.

The starlings, when they begin to feel the effects of the material, do seem to congregate around puddles of water near their roost, and those who so congregate seem to die there without trying to go further unless they are disturbed while still just in the primary stages of toxicosis. They seem to have no tendency to flutter or flop around. They will fly, when able, if disturbed by a man approaching within a few feet, but those who are too "tired" to fly don't even try to move away unless you reach down to grab them, and they emit no distress or alarm calls unless actually grabbed by someone. This behavior should significantly reduce the probability of attracting owls, who are primarily night feeders, and who hunt as much or more by sound than by sight. Owls are very sensitive to the active ingredient, CPT.

There were 72.4 gallons of BCF 7000 used in this project's initial treatment phase, and there has been an additional 6 gallons used in the balance of calendar year 1985, for a total of 78.4 gallons used. At 20% active ingredient and 8.8 lb/gal would be a total of 138 pounds of active ingredient used for the entire year on this project.

SUMMARY

There is much testing yet to be done, but we have shown that an environmentally sensitive project of this type can be handled with an acceptable safety margin, and without incident, if it is done with the right preliminary studies, the right products, the right procedures, and the right public relations. We of the pest control industry who do bird management must always do it right, or we're not going to be allowed to do it at all.

APPENDIX I

Unit Bird Pickup Totals - Initial Treatment

Crude, LERU	3,463 Starlings	31 Pigeons		
#5 Boiler House	347	8		
Wax Perk	-0-	110		
HF Alky	253	11		
Garage	2	29		
Lube Sol Ext	11	-0-		
DeCoker	4	29		
Cyclohexane	2	-0-		
Cat Cracker	7	7		
PDA	-0-	2		
LPG Unifier	48	14		
Club Room	4	-0-	2 Sparrows	
Shops	-0-	-0-		
Can Plt	10	16		
Plant Inspection	-0-	-0-		
Cat Poly	-0-	-0-		
MEK	-0-	1		
Tank Farm	1,156	3		1 Cowbird
Plant Total	5,307 Starlings	261 Pigeons	2 Sparrows	1 Cowbird

PROJECT SERVICE / BIRD PICKUP CHART

Notation above identifies unit

Date

* this indicate unit serviced this date
Bold numbers in upper right hand corner indicate number of pigeon picked up in unit that day.
** with number indicates raptor seen feeding on carcass
Number in () indicates sparrow pickup
numbers in lower left hand corner indicate starling pickup

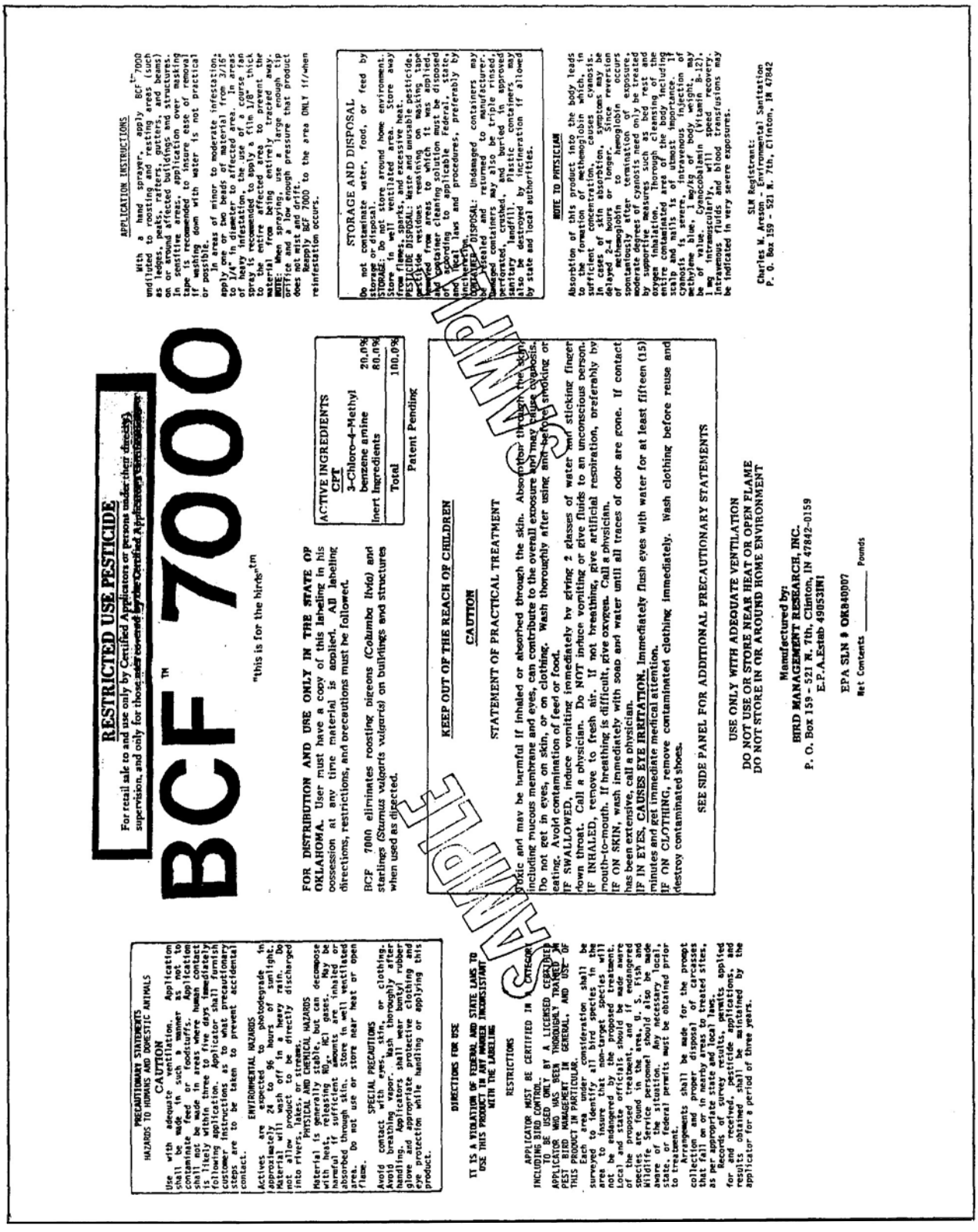
*** indicate part of tank farm not picked up this day

No bird pickup 3/3, 3/10, & 3/17/85 following day – 2 day total.

Date	Crude/LERU	#5 B.H./#3 Water Tr	Wax Perc Area	H F Alky/Isom	Garage	Lube Solv Ext	DeCoker	Cyclohexane	Cat Cracker	P D A	L P G Unifier	Club Room	Can Pit/Zone B Maint	Shops	Plant Inspection	Cat Poly	M E K	Tank Farm
2/27/85	*																	
2/28/85	* 330																	95
3/1/85	514																	311
3/2/85	383	30		24														95
3/3/85 #																		
3/4/85	* 115		*	25								29						86
3/5/85	8 1,376	*	*	* 80														21
3/6/85	2 248	231	37	17	*	*												154
3/7/85	199	10	47	4 16		3						6						1 110
3/8/85	* 3 67	* 1 14	**4	1 10	15	*	*					2 5						1 36
3/9/85	* 8 44	5	4	1 1	* 2		2	*	*	*			*					1***
3/10/85 #	*	*		*			*					*						
3/11/85	6 131	6 40	1	* 1 19	7 1	6	8		4	4		5 2	3	*	3	*		174
3/12/85	* 43	9		41	2 1		8	*	*	3		3 2			*	*		52
3/13/85	2 10			5	3							4	1		10 4			
3/14/85	1		* 7	* 4 9		* 2	2 1	* 2	2				*	*	4			1 5
3/15/85	2 2	* 1 8	6	5			* 9 3			*	* 2		(1)		2 2	*	*	16
3/16/85			* **1										*	*				
3/17/85				*						*			*	*			*	
3/18/85			3	1					1				(1)		1		1	

APPENDIX III

Sample label of BCF 7000



RESTRICTED USE PESTICIDE

For retail sale to and use only by Certified Applicators or persons under their direct supervision, and only for those uses covered by the Certified Applicator's Certification

BCF™ 7000

"this is for the birds."™

FOR DISTRIBUTION AND USE ONLY IN THE STATE OF OKLAHOMA. User must have a copy of this labeling in his possession at any time material is applied. All labeling directions, restrictions, and precautions must be followed.

BCF 7000 eliminates roosting pigeons (Columba livia) and starlings (Sturnus vulgaris) on buildings and structures when used as directed.

ACTIVE INGREDIENTS

CPT 3-Chloro-4-Methyl benzene amine	20.0%
Inert Ingredients	80.0%
Total	100.0%

Patent Pending

KEEP OUT OF THE REACH OF CHILDREN

CAUTION

STATEMENT OF PRACTICAL TREATMENT

Toxic and may be harmful if inhaled or absorbed through the skin. Absorption through the skin, including mucous membrane and eyes, can contribute to the overall exposure and may cause cyanosis. Do not get in eyes, on skin, or on clothing. Wash thoroughly after using and before smoking or eating. Avoid contamination of feed or food.

IF SWALLOWED, induce vomiting immediately by giving 2 glasses of water and sticking finger down throat. Call a physician. Do NOT induce vomiting or give fluids to an unconscious person.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration, preferably by mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

IF ON SKIN, wash immediately with soap and water until all traces of odor are gone. If contact has been extensive, call a physician.

IF IN EYES, CAUSES EYE IRRITATION. Immediately flush eyes with water for at least fifteen (15) minutes and get immediate medical attention.

IF ON CLOTHING, remove contaminated clothing immediately. Wash clothing before reuse and destroy contaminated shoes.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

USE ONLY WITH ADEQUATE VENTILATION
DO NOT USE OR STORE NEAR HEAT OR OPEN FLAME
DO NOT STORE IN OR AROUND HOME ENVIRONMENT

Manufactured by:
BIRD MANAGEMENT RESEARCH, INC.
P. O. Box 159 - 521 N. 7th, Clinton, IN 47842-0159
E.P.A.Estab 49053IN1

EPA SLN # OK840007

Net Contents _____ Pounds

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Use with adequate ventilation. Application shall be made in such a manner as not to contaminate feed or foodstuffs. Application shall be made when humans are not likely within three to five days immediately following application. Applicator shall furnish customer instructions as to what precautionary steps are to be taken to prevent accidental contact.

ENVIRONMENTAL HAZARDS

Actives are expected to photodegrade in approximately 24 to 96 hours of sunlight. Material will wash off in a heavy rain. Do not allow product to be directly discharged into rivers, lakes, or streams.

PHYSICAL AND CHEMICAL HAZARDS

Material is generally stable but can decompose if heated above 300°C. May be harmful if sufficient amounts are inhaled or absorbed through skin. Store in well ventilated area. Do not use or store near heat or open flame.

SPECIAL PRECAUTIONS

Avoid contact with eyes, skin or clothing. Avoid breathing spray mist. Wash thoroughly after handling. Applicators shall wear bunkyl rubber glove and appropriate protective clothing and eye protection while handling or applying this product.

DIRECTIONS FOR USE

IT IS A VIOLATION OF FEDERAL AND STATE LAWS TO USE THIS PRODUCT IN ANY MANNER INCONSISTANT WITH THE LABELING

RESTRICTIONS

APPLICATOR MUST BE CERTIFIED IN CATEGORY INCLUDING BIRD CONTROL.

TO BE USED ONLY BY A LICENSED CERTIFIED APPLICATOR WHO HAS BEEN THOROUGHLY TRAINED IN PEST BIRD MANAGEMENT IN GENERAL, AND USE OF THIS PRODUCT IN PARTICULAR.

Each area under consideration shall be surveyed to identify all bird species in the area to insure that non-target species will not be endangered by the proposed treatment. Local and state officials should be made aware of the proposed treatment and if endangered species are found in the area, U.S. Fish and Wildlife Service personnel should also be made aware of the situation. Any necessary local, state, or federal permits must be obtained prior to treatment.

Arrangements shall be made for the prompt collection and disposal of all carcasses that fall on or in nearby areas to treated sites, as per appropriate state and local laws.

Records of survey results, permits applied for and received, pesticide applications, and results obtained shall be maintained by the applicator for a period of three years.

APPLICATION INSTRUCTIONS

With a hand sprayer, apply BCF™ 7000 undiluted to roosting and resting areas (such as ledges, peaks, rafters, gutters, and beams) on or around affected buildings and structures. In sensitive areas, application over masking tape is recommended to insure ease of removal if washing down with water is not practical or possible.

In areas of minor to moderate infestation, apply one or two beads of material from 3/16" to 1/4" in diameter to affected area. In areas of heavy infestation, the use of a course spray is recommended. Apply a film of this material from being entirely tracked away. NOTE: When spraying, use a large enough tip orifice and a low enough pressure that product does not mist and drift.

Reapply BCF 7000 to the area ONLY if/when reinfestation occurs.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

STORAGE: Do not store around home environment. Store in well ventilated area. Store away from flame, sparks and excessive heat.

PESTICIDE DISPOSAL: Waste and unusable pesticide, pesticide residues remaining on masking tape removed from areas to which it was applied, and container cleaning solution must be disposed of according to applicable Federal, state, and local laws and procedures, preferably by incineration.

CONTAINER DISPOSAL: Undamaged containers may be sealed and returned to manufacturer. Damaged containers may also be triple rinsed, perforated, crushed, and buried in approved sanitary landfill. Plastic containers may be incinerated by infection if allowed by state and local authorities.

NOTE TO PHYSICIAN

Absorption of this product into the body leads to the formation of methemoglobin which, in sufficient concentration, causes cyanosis. In cases of skin absorption, symptoms may be delayed 2-4 hours or longer. Since reversion of methemoglobin to hemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need only be treated by supportive measures such as bed rest and oxygen inhalation. Thorough cleansing of the entire contaminated area of the body including scalp and nails is of utmost importance. Cases of severe intoxication with signs of methylene blue, 1 mg/kg of body weight, may be of value. Cyanocobalamin (Vitamin B-12), 1 mg intramuscularly, will speed recovery. Intravenous fluids and blood transfusions may be indicated in very severe exposures.

SLN Registrant:
Charles W. Areson - Environmental Santtation
P. O. Box 159 - 521 N. 7th, Clinton, IN 47842

SAMPLE